

ment to enter the liver where the umbilical vein joins the left portal vein. The catheter then crosses the portal vein to enter the ductus venosus and ascends through the ductus venosus to enter either the left or middle hepatic vein and from thence to enter the inferior vena cava on its way to the right atrium. Proper positioning of umbilical venous catheters should show the tip in the intrathoracic inferior vena cava or the right atrium.

About 17% of infants studied by the sonographic technique have had clinically evident signs of vascular compromise. Of these infants, ultrasound detected abnormal intravascular echoes or lack of radial pulsation in 10 of 12 or 83%. Abnormal echogenic foci, consistent with both thrombus and intimal dissections, were found. Ultrasonically detected abnormalities can be followed to resolution in infants. Typically the echogenic foci vanish and normal radial pulsation returns. The future evaluation of umbilical catheters within abdominal vessels can be augmented by combining Doppler analysis of flow within these vessels and high-frequency ultrasonic imaging. BARBARA A. CARROLL, MD

REFERENCES

- Oppenheimer DA, Carroll BA: Ultrasonic localization of neonatal umbilical catheters. *Radiology* 1982 Mar; 142:781-782
- Oppenheimer DA, Carroll BA, Garth KE: Ultrasonic detection of complications following umbilical arterial catheterization in the neonate. *Radiology* 1982 Dec; 145:667-672
- Oppenheimer DA, Carroll BA, Garth KE, et al: Sonographic localization of neonatal umbilical catheters. *AJR* 1982 Jun; 138:1025-1032

Ultrasonographic Evaluation of Fetuses

BECAUSE OF technical improvements in both gray-scale and real-time ultrasound, prenatal ultrasonography has advanced far beyond its traditional roles of locating the placenta and determining fetal position, number and age. The fetus itself has come under increasing scrutiny. A variety of fetal anomalies can be consistently identified in utero. Recognition of many of these can dramatically alter patient management including the recent option of in utero interventional procedures.

The search for fetal anomalies with ultrasonography is carried out in two distinct patient groups. In the first group, the fetus is examined because of a genetic or familial history of a heritable disorder or an incidentally discovered risk factor such as an elevated amniotic fluid α -fetoprotein level. In these patients the prevalence of abnormality is high and an ultrasonographer knows which abnormalities may be present.

The second group includes those in whom a fetal abnormality is found serendipitously while the patient is being scanned for an obstetric indication, such as a discrepancy of size versus dates. In these patients the prevalence of anomalies is low. There is no genetic history of which abnormalities could conceivably be present. In such instances it is important not only to

identify but to accurately characterize the lesion. For example, one should distinguish hydranencephaly from hydrocephaly; the prognostic implication is obvious. Accurately defined anomalies can alter the mode of delivery such as in cases of conjoined twins or a large sacral teratoma. The detection of such abnormalities as bilateral hydronephrosis, immune hydrops fetalis or hydrocephalus often affects the timing of delivery because such fetuses may be cared for more appropriately in a neonatal intensive care nursery than in their mother's womb. In addition, such lesions as posterior urethral valves and hydrocephalus can be diagnosed ultrasonographically and potentially treated in utero.

WILLIAM K. HODDICK, MD
ROY A. FILLY, MD

REFERENCES

- Callen PW: *Ultrasonography in Obstetrics and Gynecology*. Philadelphia, WB Saunders Co, 1983
- Filly RA, Golbus MS: Ultrasonography of the normal and pathologic fetal skeleton. *Radiol Clin North Am* 1982 Jun; 20:311-323
- Fiske CE, Filly RA: Ultrasound evaluation of the normal and abnormal fetal neural axis. *Radiol Clin North Am* 1982 Jun; 20:285-296
- Harrison MR, Golbus MS, Filly RA: Management of the fetus with a correctable congenital defect. *JAMA* 1981 Aug 14; 246:774-777

Percutaneous Drainage of Abdominal Fluid Collections

A LOCALIZED fluid collection in a critically ill patient who has a clinical diagnosis of abdominal abscess following a surgical procedure or an injury would have required surgical intervention in previous years, both for diagnosis and for drainage. Now in many instances these lesions may be percutaneously aspirated for a diagnosis and percutaneously drained for treatment by an interventional radiologist.

Locating a suspected intra-abdominal abscess is usually done by either sonography or computed tomography. These cross-sectional imaging techniques allow intraorgan, extraorgan and extra-alimentary fluid collections to be imaged both with precision and accuracy and in a rapid and noninvasive manner. Using these techniques, a safe percutaneous access to the fluid collection that avoids bowel, unaffected solid viscera and vessels can be planned. After finding the collection, an 18- or 20-gauge needle is placed in the fluid collection and a diagnostic aspirate is obtained. If the collection is unmistakably pus or infectious as noted by a Gram's stain, then a percutaneous catheter can be inserted to allow for continuous drainage. Appropriate antibiotics can be selected on the basis of results of a Gram's stain while results of cultures are pending. The catheter is connected to a closed-bag drainage system until drainage is completed. Noninfectious collections either may be aspirated through the needle or, if they are very large, a catheter may be inserted to allow for complete drainage over a one- to two-day period.

These drainage procedures are done using local